Video Facilitator's Guide

First Grade

Creating a Context for Addition

Highlighted Process Standards for Mathematics

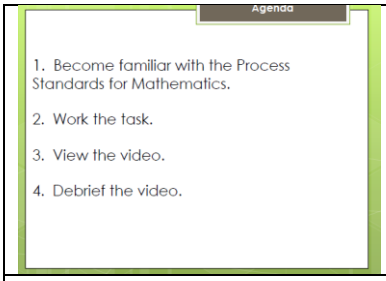
- #2 – Reason abstractly and quantitatively.
- #3 – Construct viable arguments and critique the reasoning of others.
- #5 – Use appropriate tools strategically.
- #6 – Attend to precision.
- #7 – Look for and make use of structure.

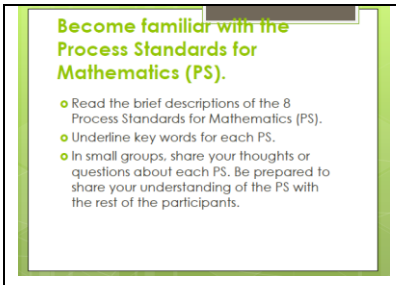
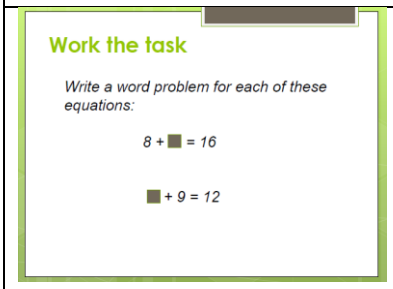
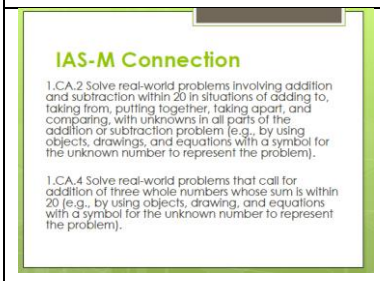
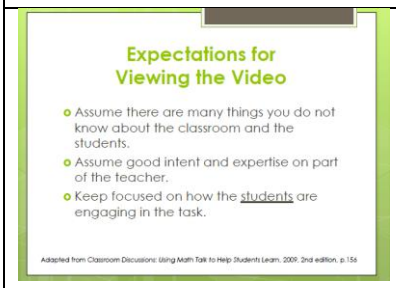
Summary of Video

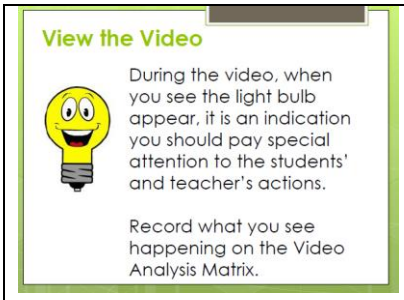
In this lesson, the first-grade teacher engages her students in writing word problems for addition equations with the unknown in various positions. Sometimes the unknown is the total and sometimes the unknown is one of the addends. After creating a context for the equation, students will solve the problem using various tools, such as base-ten blocks, counters, and pictures.

Prepare for Facilitation

Make sure that you do the following before your presentation:
1. Read Facilitator's Guide Overview and this document that is specific to the Creating a Context for Addition video.
2. Download the video onto desktop of computer.
3. Make copies of handouts.
4. Review the Process Standards for Mathematics.
5. Review PowerPoint slides provided.
6. Ensure that the presentation room includes appropriate audio and video equipment for showing video.

	*Agenda* Briefly share the agenda for the session. Remind participants that the purpose of this session is to introduce teachers to the Process Standards for Mathematics and observe how they are enacted in the elementary classroom.
	Process Standards for Mathematics (PS) Pass out handout entitled "Brief Version of the Process Standards for Mathematics". Have participants read the descriptions of the eight PS. As they read, have them underline key words for each of the eight standards. After everyone has finished, have the participants get into small groups to share their thoughts about each PS. After sufficient

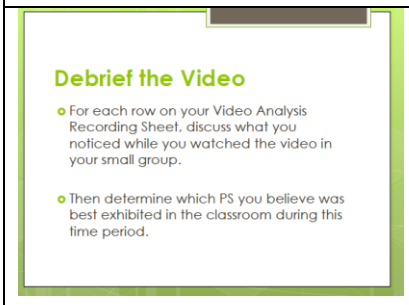
	time has passed, debrief the findings in whole group discussion. One way to do this would be to ask each group to share their thoughts on one PS, until all groups have shared or all PS have been discussed. As each group shares, ask for additional input from other small groups and/or add your own ideas, if necessary, to clarify the intent of each practice. Note: This step may be optional if the participants are already familiar with the PS or have participated in other video reviews from the *Process Standards for Mathematics in Action!* series.
	*Work the Task* Have participants work the task on the PPT slide. Read the directions from the slide, and ask participants to work the task individually. After everyone has completed the task … • have one or more individuals share their word problem with the rest of the participants. • discuss if one of the word problems was more difficult to write and why.
	*Connect to IAS for Mathematics* Ask participants to consider the potential of this task to support the development of the skills necessary for children to meet the standard listed below: **1.CA.2** Solve real-world problems involving addition and subtraction within 20 in situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all parts of the addition or subtraction problem (e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem). **1.CA.4** Solve real-world problems that call for addition of three whole numbers whose sum is within 20 (e.g., by using objects, drawing, and equations with a symbol for the unknown number to represent the problem).
	*Expectations for Viewing Video* Go over the following expectations before viewing the video. 1. Assume that there are many things you do not know about the students, the classroom, and the shared history of the teacher and students on the video. 2. Assume good intent and expertise on the part of the teacher. If you cannot understand his or her actions, try to hypothesize what might have motivated him or her. 3. Keep focused on how the students are engaging in the task(s) and whether they are interacting in ways that align with the PS.



Viewing the Video

Before viewing the video, distribute the Video Analysis Matrix. Explain that when the participants notice the light bulb icon, they should begin watching for teacher and student actions that align with one or more of the mathematical practices.

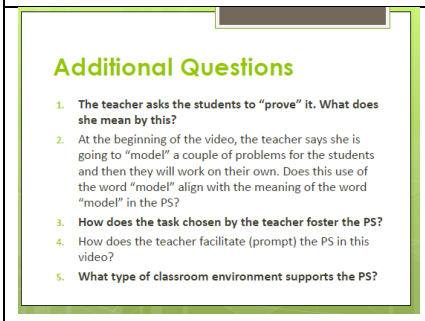
View the video together. You may want to pause the video briefly at the end of each time period when an icon is displayed to allow participants time to note their ideas on the Matrix. (See sample matrix in this facilitator's guide for when each time period ends.)



Video Debriefing:

After watching the video, ask participants to share in small groups what they noticed for each time period listed in the Video Analysis Matrix. Ask participants to add a third column to the matrix in which they identify the possible PS that are exhibited.

After sufficient time has passed, ask if anyone is willing to share their PS, supporting it with evidence from the video. Repeat this process for each time period. If necessary, have teachers re-watch segments of the video. Explain to the participants there may be differing opinions about which PS is most prominent; however, each PS mentioned must be backed up by evidence from the video. If necessary, have the participants refer back to the wording of the PS to clarify its meaning. (For large groups of participants, consider the use of small-group discussion prior to whole-group discussion.) Remember that student and teacher actions may be interpreted in different ways, so there are no "right" answers, although the table does provide sample responses. The goal of documenting evidence of the PS is to provoke teacher reflection and discussion about the PS.



If time allows, follow up the discussion of the PS with one or more of these questions:

1. The teacher asks the students to "prove" it. What does she mean by this?
The teacher seems to be using this phrase to indicate the students need to solve the equation and to justify that solution.

2. At the beginning of the video, the teacher says she is going to "model" a couple of problems for the students and then they will work on their own. Does this use of the word "model" align with the meaning of the word "model" in the PS?
The word "model" has many different meanings in mathematics. The teacher is using the word "model" to mean she is going to work an example for them so the students know what her expectations are. In PS #4 the term "model" is referring to a mathematical model that represents a real-life situation. This model could be symbolic in nature or could consist of pictures and drawings in the lower grades.

3. How does the task chosen by the teacher foster the PS?
Possible answers:

	The task is open-ended and has more than one correct answer. Students have the opportunity to share their thinking and their approach used to solve the problem. *The task focuses on contextualizing an equation, which supports PS #2, reasoning abstractly and quantitatively.* 4. How does the teacher facilitate (or prompt) the PS in this video? *Possible answers:* *The task that the students are working on supports PS #2 – reason abstractly and quantitatively – through the lesson. The students must contextualize a numerical representation of an equation and then solve the problem. To support communication of explanations, the teacher brings students to the front of the room to share their thinking. She also attends to the precision of the students' explanations and asks clarifying questions when necessary.* 5. What type of classroom environment supports the PS? *Possible answers:* *Students work together to solve problems.* *Students feel comfortable sharing their work and discussing their findings. Students have a variety of tools available and use a variety of tools as they problem solve.*

SAMPLE COMPLETED VIDEO ANALYSIS MATRIX

Video Clue	Evidence of Student and Teacher Actions	Process Standards for Mathematics
2:51  1	Students are responding to the teacher's request to develop a story problem for 8 + ? = 16. In this case, students are *contextualizing* the addition equation. In doing so, students are required to make sense of what the quantities in the problem represent and how they are related. This PS is represented throughout the remainder of the video.	#2 Reason abstractly and quantitatively.
6:40  2	Ms. Treeter asks the students to "prove" the equation, and she references using manipulatives. The teacher is not focused specifically on the correct answer, but whether students can justify their answer.	#3 Construct viable arguments and critique the reasoning of others.
7:15	The students and Ms. Treeter discuss how they can use the base ten blocks (or	#5 Use appropriate tools strategically.

 3	place value counters, pennies) and break-apart sticks to represent the given problem.	
12:48  4	Tonya and Ms. Treeter use the break apart stick to represent how Tonya was counting on. Using the break apart stick (a pencil) allows students to see structure in numbers. For example, seeing 12 as being decomposed into 9 and 3.	# 7 Look and make use of structure
13:17  5	Ms. Treeter asks Demonica whether she agrees with Tonya's thinking and to justify herself. This important teacher move ensures that students also try to think critically and build on the thinking of other students.	#3 Construct viable arguments and critique the reasoning of others.
16:02  6	Lexie reads her story problem, but hesitates when she poses the question. Students need opportunities to attend to precision in how they communicate their thinking. Ms. Treeter also rephrases "how many" to clarify Lexie's question as "how many bunnies."	#6 Attend to precision